Office of Force Transformation
Department of Defense
Transformation Trends
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"Future dangers will less likely be from battles between great powers, and more likely from enemies that work in small cells, that are fluid and strike without warning anywhere, anytime…"

Defense Secretary Donald Rumsfeld, June 5, 2004

Transformation and the Changing Character of War?

Arthur K. Cebrowski
Director, Office of Force Transformation

Our inability to predict the future does not mean that we know nothing about it, at least within reasonable bounds. Just as there are constants, so are there trends – growing ethnic and religious strife, the reshaping of nation-states, shifting and emerging economic centers, the escalating value of information and learning, the proliferation of information technologies in relatively undeveloped societies and nations, and the emergence of global, transnational terrorism. These trends and others are reshaping our government, our economy and our society. Their scope and pace are transforming transformation -- and the character of war.

New threats are emerging from societies and people who remain disconnected from the larger evolving global system. Great power war has been taken off the table, and we have become so proficient in conventional state level conflict that the locus of violence has shifted to the level of the individual actor. This is a more nuanced threat -- one defined by the vague, the inconsistent, and the irrational dimensions that we are still at a loss to measure. We are discovering that our forces must be rebalanced and realigned to the new strategic context. If the character of war were not changing, these realignments would not be necessary.

The challenges facing us do not merely require us to redefine the military piece of national security for an environment lacking a "traditional" battlefield threat. We must forge the broader internal and international security instruments necessary to support U.S. leadership in a world where accelerating change and increasing ambiguity are dominant features, and where threats can adapt and evolve more rapidly than we are transforming.

Rob Holzer, Outreach Director, Office of Force Transformation
1401 Wilson Blvd, Suite 301, Arlington, VA 22209
Tel: 703-696-5715 email: rob.holzer@osd.mil

The transformation started at the beginning of the administration has, itself, been transformed. But we must move faster -- increasingly, the pace of transformation is not one we set for ourselves. National defense is no longer just about the Department of Defense…Homeland defense is no longer an abstraction to the average American citizen, nor is it conducted solely at long range. This is no longer just about projecting power -- rather, it is about exporting security.

Our view of strategic response has been altered. Responsive means *reactive* – that we have ceded initiative to an adversary and are prepared to act in the wake of an attack. The President's *National Security Strategy* recognizes that the consequences of a potential WMD attack mandate that we be *preventative.* This is a different approach reflecting a different role for defense in national security and a need for different capabilities. For example, if we are going to be preventative rather than just punitive, a change in intelligence capabilities is indicated. Clearly, we have to know more sooner. We must acquire the ability to better identify and understand potential adversaries. This calls for different organizations, different systems, and different ways of sharing intelligence. We need the ability to look, to understand, and to operate deeply within the fault lines of societies where, increasingly, we find the frontiers of national security.

There used to be some general agreements about the capabilities needed in our forces. These addressed where we should deploy military forces, the method of deploying and using those forces, their general structure and how we should organize them, and the kinds of technology they should possess. These have been dashed on the hard shoals of reality. The scope and the pace of geo-political change compel organizations and doctrine that can readily adapt and retain flexibility within increasingly complicated operating domains. Increasingly, whether in business or war -- adaptivity equates to effectiveness and survival. The nation's military force must be an adaptive instrument of national power. It must provide *political* utility across a much more diverse and difficult range of scenarios and circumstances. This force must act as a flexible instrument of policy engagement, not simply provide a larger sheaf of thunderbolts.

There are two ways of deciding what U.S. forces ought to be. One is inductive, an approach that looks for weaknesses, gaps, deficiencies, and problems, and determines how to correct them. This is the way Pentagon planners went about designing U.S. military forces for over half a century. Over time, however, our force planning process took on the patterns and predictability of the threat it sought to counter. In the 1950s, for example, the combined average design, development, engineering, and production time for aircraft and tanks was less than a decade. By the late 1970s it was approaching two decades. There were exceptions, but the increasing length of the cycle was pronounced, and all other dimensions of the U.S. military reflected the pattern. In general, during the Seventies and Eighties our forces were designed by the Soviet Union. In the Nineties, they were defined by the inertia of what was already in the program. Now we must think for ourselves.

The most significant shift in our approach to force planning is the rise of deductive thinking and capabilities-based planning. Capabilities-based planning provides a framework for understanding some of the persistent and emerging challenges before us. While the reality is far more complicated, these challenges have been grouped as *traditional, irregular, disruptive,* and *catastrophic*. They indicate how we must balance the force and how we balance risk -- not just technical risk, but all types of risk. Part of capabilities-based planning is a conscious search for the unexpected, the deviations from the usual, and the bounds of feasibility. This is an indicator of the direction of future force capabilities. We once

justified systems based on their capabilities against *traditional* battlefield challenges. To the degree that a system provided capability against *irregular* or *catastrophic* challenges, it was an additive "good." But increasingly, new capabilities that address only traditional threats will simply be moved off the table. Now we expect to justify systems based on their capabilities against *irregular* or *catastrophic* challenges -- the degree of capability provided against *traditional* challenges will be the added benefit. This says a lot about the programs that will be vulnerable when the budget is under stress. We have yet to see this justification used for many of the largest and most expensive programs in the Department. We have been living the contradiction of buying a force for great power war, only to discover that it has to fit an operational shoe it wasn't designed to wear. These changes were predictable…and ignored.

The need to transform the role of defense in national security and the organizations and processes that control, support and sustain it cannot be ignored. To do so is an act of denial – denial of the profound change occurring in our world everyday. There is a wealth of evidence that we have passed the tipping point in transformation. Yet, while we may have left the starting blocks, we shouldn't anticipate the tape. Transformation is a continuing process – a race we run against our own self-satisfaction, complacency and hubris as much as the challenges of potential adversaries. Transformation seeks to create our future, and to shape that future for a greater good, not simply fall victim to other inertias on the global stage. It does so, in part, by co-evolving organizations, processes, and technology. However, transformation begins and ends with culture. Transformation is first and foremost about changing culture. Culture is about behavior – about people – their attitudes, their values, their behaviors, and their beliefs. What we believe, what we value, and our attitudes about the future are ultimately reflected in our actions – in our strategies and processes, and the opportunities they create.

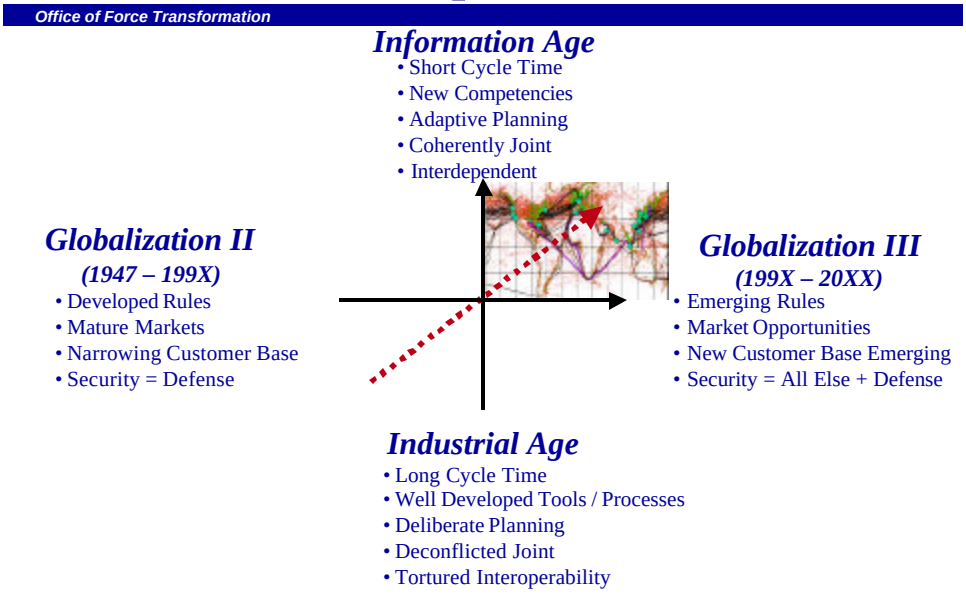
Opportunities in the Information Age

There are two vectors for transformation acting simultaneously on the force and how it is used. The first is the appearance of the civilization's third great period of globalization; the second, and *more important* is society's movement from the industrial age to the information age. Both phenomena involve much of the world including developing nations. This presents not only new rules and challenges for security, but also creates new opportunities for success.

One of the compelling features about these phenomena is that both are happening simultaneously. Globalization II was about well-developed rules. In business terms, it was a "mature market." We understood it well, and we knew what returns and what margins existed in that market. But, we also understand that even as the "market" for national security is growing, the customer base for the capabilities of this earlier era is shrinking. Globalization III presents unwelcome new "markets" for national security, and a realization that the rule sets governing our previous approach to national security are increasingly unsuited to the scope and pace of the challenges we face. We've also relearned that national security is not just about Defense.

Just as the character of the new globalization is altering the geo-political landscape, so too are we learning that movement of societies from the industrial age to the information age is altering the efficacy of the methods and means that have defined our military capabilities for the better part of a century. Many well-developed concepts, tools and capabilities of the industrial age are simply inadequate to the pace, rules and relationships of the age of information.

Trends in Security Competition



"It's the Behavior…"

As discussed above, the current and future strategic environment is easy to describe in terms of change. Some see complexity, and still others say the magnitude of change suggests uncertainty. But, the labels we attach to this strategic entropy are less important than our intellectual response. With the increased use of words such as "change," "uncertainty," and "complexity" the transforming of transformation should not be a surprise -- nor should its impact on the character of war.

Warfare, conflict, and instability are inherent features of our world. Warfare is a pattern of human behavior that spans recorded history. The *nature* of warfare, and conflict between nations and states is fundamentally unchanging -- it is organized force for political ends. However, because war is both a political action and a social institution, the *character* of warfare is changing just as societies, political entities and technologies change. Accordingly, our American fixation has been the technical and industrial, means of waging war. Our collective over-awe at the significance of our industrial achievements often leads us to expect strategic effects from systems and capabilities designed for tactical or operational impact. The result is a growing imbalance between our current capabilities and the range of security challenges for which our technology isn't the sole answer. As the eminent historian Michael Howard has written:

"Let me repeat the analogy about the drunk who lost his watch in a dark alley, but was found looking for it under a lamp post because there was more light there. The light provided by our knowledge of technological capabilities and our capacity for strategic analysis is so dazzling as to be almost hypnotic; but it is in those shadowy regions of human understanding based on our knowledge of social development, cultural diversity and patterns of human behavior that we have to look for the answers."

The predominant pattern of *human behavior* in the information age is *network behavior*. Network-centric warfare is about human behavior in a networked environment, and in warfare, human behavior ultimately determines outcome.

New Metrics

The changing face of warfare takes on the characteristics of its age. Nations, states and others who wage war, do so in ways appropriate to their culture, values and resources. As network behavior in the form of organizations, doctrine, strategy, processes and communication are valued upward, the character of warfare is being altered and we see new metrics emerging -- metrics that define the entry fee characteristics for future forces. At one level they are access, speed, distribution, sensing, mobility, and networking. These metrics are scale-free and are as valid at the tactical as they are at the operational and the strategic levels of war. And they are as applicable in stability, reconstruction and peacekeeping as they are in high intensity combat. Our forces are moving toward these metrics. We've seen it in combat operations in Iraq – in both major combat operations and beyond. But as laudable as this shift has been, it's not enough.

Reliance on well-trained and competently led troops is a constant in warfare. While that won't change, the characteristics that create new competitive advantage are changing with the age. They have had their own enduring relevance, but the particulars of the current age have changed their meaning and sharply revalued them upward. These four metrics for success in the information age, suggest the essential characteristics of future forces. They are the ability to:

- create and preserve options
- develop high transaction rates
- develop high learning rates
- achieve overmatching complexity at scale

Creating and Preserving Options

In information age operating environments -- where accelerating change and ambiguity dominate -- competitive advantage often depends on the expense and choice of options. Due to increased competition in the global arena, nations, organizations, and businesses recognize that the most competitive strategy for enduring survival is the creation and preservation of options. An option is the right, but not the obligation, to take or preserve an action in the future. Options allow organizational adaptation in a rapidly changing battle space, particularly those dominated by increasing complexity.

The ambiguities resident in a complex adaptive environment demand flexibility. In financial markets, the value of flexibility is calculated and robustness is recognized as a requirement for survival. In this context, robustness is described as a function of variety, diversity, scalability, high numbers or transaction rates, and options. An options model for success and survival in warfare is similar to profitability and solvency in the global market place - mitigation of risk by hedging against the uncertainty inherent in rapid and accelerating change. While losses in combat, both in personnel and materiel, are disproportionately higher to losses in any single business endeavor, solutions for either are similar. The similarity resides in the valuation of flexibility. Options are a means to provide that flexibility.

In these dynamic times, the popular Pentagon practice of picking winners and losers early in the name of efficiency is perilous and wrong. Why? In short it's about competition. We end the competition of ideas far too early in many of our processes, and the loss is not just to the firms involved, but also to the government. This diminishes institutional learning and decreases the generation of options. In force building, options develop through a richer mix of approaches to similar problems – the consequence of which is higher learning quality at higher learning rates – both for the process and the products that are built. In combat, options generation appears in new organizational forms of well-networked combined arms capability with the ability to develop and act on shared situational awareness. Hence, combatants can reach for a broader set of tactics – or, in a word, more *options*. Options, whether in force building or actual combat, complicates an opponent's situation by increasing his risk of an inappropriate action or even paralysis.

Providing the tools necessary to create value and ensure competitive advantage should not be based on deterministic methods. Avoidance of attempts to predict the future is critical. Instead, we must hedge against potentially harmful contingencies by considering and making uncertainty a positive trait rather than a negative one. The resulting upstream influence provides the nation and its defense establishment the opportunity to create security value by establishing future competitive positions early. The subsequent policy objective of dissuasion is thus more clearly supportive of a *preventative* strategy and could potentially displace some punitive elements of previous deterrence options. Although sometimes difficult to quantify, present value of future capabilities and options for these can have a powerful dissuasive effect.

Transaction Rates and Learning

The complexity of warfare in the information age compels increased speed. In this context, "speed" is a time-based competition or "transaction rate." Some might call this tempo, others might call this operational speed. In increasingly dynamic battle space, the effects of transaction rates are only amplified -- either as a shortcoming or an advantage. Locally, high transaction rates can be thought of simply as a number of interactions. More broadly, transaction rates are about the numbers of actors, and the number of interactions with the competition and the environment. The quality of those interactions over time determines learning and success.

As the pace of change in the information age accelerates, so must the institutional transactions that create capabilities from "learning." Stagnation of institutional learning comes at the expense of future advantage. The world is watching -- as we perfect the comfortable and familiar "known," new knowledge enters our force glacially, and we become a strategically fixed target. Our adversaries are adapting and evolving at the speed of business while we're operating at the speed of doctrine. If we are to take advantage of what the new age offers, faster institutional learning is critical. This is why transformation includes the transformation of the management of defense.

Overmatching Complexity at Scale

William Ross Ashby's "Law of Requisite Variety" posits, "the larger the variety of actions available to a control system, the larger the variety of perturbations it is able to compensate." In other words, the more robust the capabilities in our force, the more options we have against complex forces and in complex terrain.

Enemies under pressure always retreat to more complex terrain – from the high seas to land, from open land to cities and jungles, and ultimately to very complex social and political domains. A working definition of complexity is the number of entities, the variety of entities, and the relationships among them. In general, a more complex force prevails over a less complex force. We have little difficulty understanding complexity in a physical sense -- this is why we like an enemy to mass; anything we can reduce to a solitary element has less complexity and is therefore vulnerable to our combined arms capabilities. This is the basis of center of gravity concepts. This is also why a guerilla force can give an armored division fits -- low mass, low technical sophistication, but very high complexity.

Scale matters as well. In complex environments, the generation of high transaction rates requires matching scale with scale while over-matching complexity. This is also why some urban fights go on for extended periods. There is an imbalance in scale, the transactions rates at the tactical level of war undergo a dramatic increase in number and character, and the metrics for success shift from mass and fires to information, intelligence, and mobility -- an area where the "outsider" is at a distinct disadvantage.

There are clearly different dimensions of complexity. We live in a physical world where "real" is defined by those things we can touch, hear, and smell. Accordingly, we traditionally conceptualize the battle space in physical terms, and develop, acquire and employ capabilities that have value in the physical world. In short, it is what we know and do best. Increasingly, however, the most complex elements of the battle space are non-dimensional. The liability of that term is that it suggests a battle space that doesn't exist in fact or form, and is thus unconsciously diminished in importance. The emerging reality is that non-dimensional battle space now defines a new strategic commons, and comprises the most complex battle space in the conflicts of the 21st century.

The New Strategic Commons

Alfred Thayer Mahan once described the sea as "a wide common."[1] This common was the international domain of trade and intercontinental communication. Nations and states aspired to access and command of this common for the purpose of establishing and protecting their own unique competitive advantages globally or regionally. The entry fee necessary to participate on this strategic common was an economic vitality sufficient to sustain a strong and capable ocean-going navy. To the degree this was possible, participation in this great common sustained or diminished a nation's position of power. Command of this common was synonymous with "command of the sea."[2] Mahan did not foresee the advent of flight or the progress of flight into space, but he would likely agree with more recent additions to the concept -- air and space.[3]

The new strategic common of the 21st century is cyberspace. But, it is a much more complex domain than that label suggests. Cyberspace is not simply "the internet." The new strategic common is the

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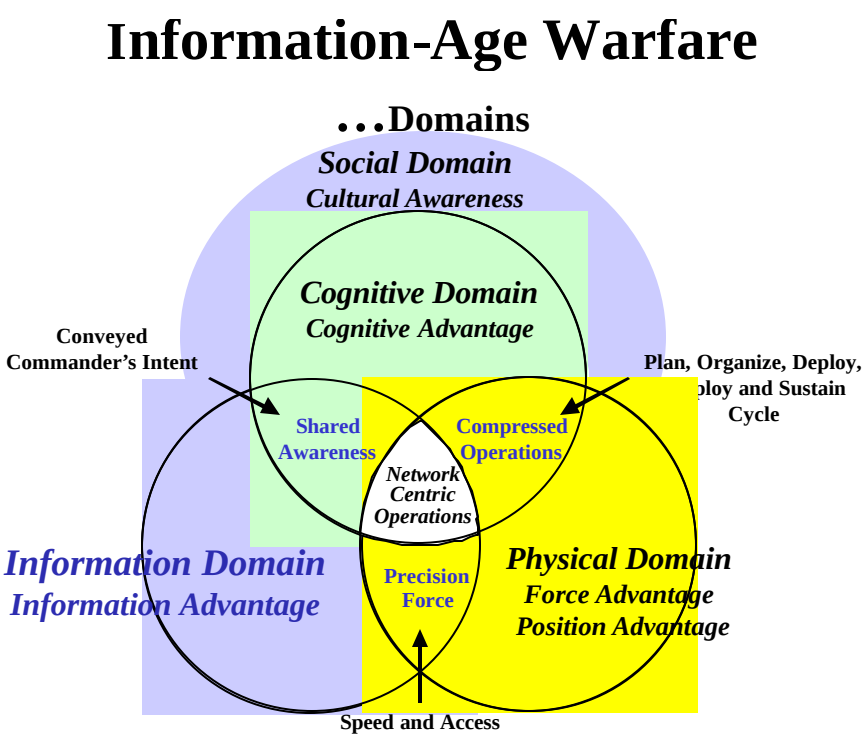
[1] Barry R. Posen, *"Command of the Commons: The Military Foundation of U.S. Hegemony,"* International Security, *Vol. 28, No. 1, Summer 2003, pp. 5-46.*

[2] "Command of the sea" comes from Paul M. Kennedy in *The Rise and Fall of British Naval Mastery* (London: MacMillan, 1983, first published Allen Lane in 1976) and is used in Barry Posen's discussion of "…command of the commons…" on page 8 of the reference 2 footnoted below.

[3] For extended discussion of the strategic commons, see, Barry R. Posen, *"Command of the Commons: The Military Foundation of U.S. Hegemony,"* International Security, *Vol. 28, No. 1, Summer 2003, pp. 5-46.*

domain of information and cognition that includes the channels of mass media and finance. Like its conceptual predecessors, it is an international domain of trade and intercontinental communication. Increasingly, it can increase, sustain or diminish a nation's position of power in economic, diplomatic, or military terms. However, it differs from its conceptual predecessors in four fundamental ways -- first, the entry fee for access and participation is very low and is thus aspired-to, influenced, and controlled less by nations and states than by individuals, organizations and institutions; next, where the sea, air and space were defined by their physical mediums, cyberspace is essentially non-dimensional -- it is increasingly a *creative* and *cultural* common defined by information, perception, cognition and belief; third, there is more being made -- it is expanding non-linearly by the second; and finally, its characteristic interactions more closely approximate the human condition, making it an enormously complex operating domain.

This domain is non-dimensional -- the domain of political victory or defeat. Yet, this complex non-dimensional battle space increasingly gives us the most problems. We profess a desire for access to the political domains of victory, yet the weight of our operational approach to this complex domain is largely measured only in physical terms. Occupying the physical battle space does not assure victory in the political domain. Political victory may be influenced by our capabilities and actions in the physical world, but is increasingly a by-product of our action or inaction in the new strategic common. It is unlikely that our forces will be denied military victory, but we may be denied political victory because we understand and act less in this complex battle space where political victory will be determined in the 21st century.



Winning the Battle for Our Future

The battle for our future has already begun. The strategic landscape is changing and reshaping itself in new forms and patterns everyday. With such diverse change happening around us, it is inconceivable

that narrow solutions will answer broader strategic demands. We must recognize not only the enduring nature of strategic change, but most importantly, that the pace of change is accelerating and is not one we set for ourselves.

Changes in the strategic environment suggest alteration of the strategies, processes and policies that govern force development. Our potential challenges are shifting. The trends suggest that a hedging strategy against a "peer competitor" is adequate to keep great power war off the table. Our organizing principles and the weight of our intellectual effort and investment strategy must shift from *traditional* battlefield challenges to the *irregular, catastrophic, and disruptive.* We also need organizations, processes, and a strategic approach to "cost" capable of delivering the requisite capabilities with dramatically decreased cycle time. A strategic approach to cost would include:

- Strategies for divestiture and devolution of processes and capabilities
- Suppressing the monetary cost of war
- Cost imposing strategies
- Mitigation of cost imposing strategies
- Reversing the current trend of paying more for decreasing returns

Cultural and societal change on a strategic scale is altering the character of war. Our future forces must certainly possess military utility with technologies like "information" and "precision." More importantly, they must also provide *political* utility across a wider range of scenarios and circumstances.

To court stasis is to invite defeat. In order for our forces to compete, survive and win the future, we must do these things today: First, we must create new organizational concepts for networked combined arms capability. In a battle space that includes both physical and non-dimensional elements, "combined arms" must include organizational and doctrinal tools for success in both. We need the capability to see and operate into the fault lines of societies where, increasingly, the frontiers of national security reside. Second, to match "scale with scale" we must increase the number of independent entities available to act over a wider battle space while altering our organizational and doctrinal constructs to push information and decision-making to the lowest possible level. Third, we must provide the network connectivity necessary for situational awareness and the ability to decide and to act independently or in concert. Finally, we must capitalize on the principle of simultaneity. This is our future -- this is how we must fight in the age of the small, the fast and the many.